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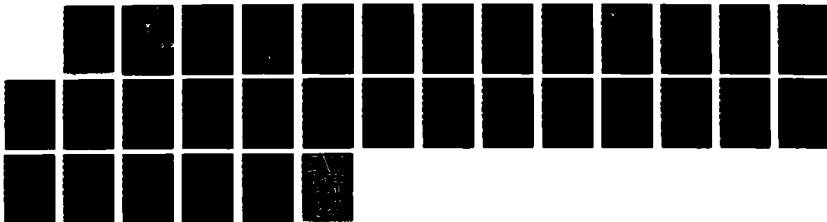
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# AIR COMMAND AND STAFF COLLEGE

## STUDENT REPORT

CONTRACTOR SUPPORT FOR AVIATION  
DEPOT SYSTEMS

MAJOR LOUIS A. BONHAM

88-0325

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Submitted to the faculty in partial fulfillment of  
requirements for graduation.

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## PREFACE

Historically, Aeronautical Depot Maintenance has cost the Department of Defense approximately \$3.8 billion per year. The current reductions in defense spending requires that each military service seek alternatives for cost reductions in its depots. In the past, the services have been unwilling to convert many organic activities to contract support due to perceptions that commercial repair sources are less responsive and flexible. In some depots, this practice has led to increased costs and shortfalls in their ability to fully satisfy peacetime or contingency requirements.

The purpose of this paper is to determine if the increased use of contractors in our depots would reduce operational support costs or improve aircraft readiness.

This research topic selection was developed and coordinated with the Office of the Director for Maintenance Policy, Office of the Assistant Secretary of Defense. Specifically, LTC Lee Thompson from that office provided invaluable background information that was helpful in developing this project.

The author also thanks members of the Aviation Logistics Office, Office of the Deputy Chief of Staff for Logistics, Department of the Army, for their technical assistance and advice.

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## ABOUT THE AUTHOR

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Major Louis A. Bonham was commissioned and received a BS degree in Political Science at Tuskegee Institute in 1974. He has more than twelve years operational and staff experience in Army Aviation Logistics. His military education includes: the Transportation Officers Basic and Advanced Courses, Rotary Wing Qualification Course, Supply Management Officers Course, and the Aircraft Maintenance Officers Course. Major Bonham is a senior army aviator and his assignments include tours at Ft Bragg, North Carolina, Korea, Ft Rucker, Alabama, Department of the Army, Washington DC, and Ft Belvoir, Virginia.

Major Bonham has obtained a vast amount of aviation experience in positions ranging from an aircraft maintenance platoon leader to a logistics officer (S-4) in several maintenance battalions. Noteworthy are his positions as Commander of an Aviation Maintenance Company at Ft Belvoir, Virginia, and as an Aviation Logistics Officer at Department of the Army, Washington DC.

## TABLE OF CONTENTS

Preface.....	iii
About the Author.....	iv
Glossary.....	vi
Executive Summary.....	vii
CHAPTER ONE--INTRODUCTION	
Background.....	1
Significance of the Problem.....	1
Assumptions and Limitations.....	3
Objectives.....	3
CHAPTER TWO--POLICIES ON DEPOT MAINTENANCE OPERATIONS....	4
CHAPTER THREE--EFFECTIVENESS OF ORGANIC AND CONTRACTOR OPERATIONS.....	8
CHAPTER FOUR--COST COMPARISON METHODOLOGY.....	12
CHAPTER FIVE--FINDINGS/CONCLUSIONS/RECOMMENDATIONS	
Findings and Conclusions.....	16
Recommendations.....	17
BIBLIOGRAPHY.....	19
APPENDIX:	
Appendix A--Department of Defense Instructions.....	21

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## GLOSSARY

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### ABBREVIATIONS

ADM - Aeronautical Depot Maintenance  
CITA - Commercial and Industrial Type Activities  
CONUS - Continental United States  
DMCS - Depot Maintenance Cost System  
DOD - Department of Defense  
DODI - Department of Defense Instructions  
DPDBS - Depot Performance Data Base System  
GAO - General Accounting Office  
JADMAG - Joint Aeronautical Depot Maintenance Action Group  
JLC - Joint Logistics Commander  
OASD (A&L) - Office of the Assistant Secretary of Defense  
(Acquisition and Logistics)  
OMB - Office of Management and Budget  
OSD - Office of the Secretary of Defense  
TAMP - Theater Aviation Maintenance Program



## EXECUTIVE SUMMARY

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**REPORT NUMBER** 88-0325

**AUTHOR(S)** MAJOR LOUIS A. BONHAM, USA

**TITLE** CONTRACTOR SUPPORT FOR AVIATION DEPOT SYSTEMS

I. **Purpose:** To determine if the increased use of contractor support in aeronautical depots will reduce operational costs or improve aircraft readiness.

II. **Problem:** The military services are reluctant to convert organic depot activities to contract support even if it enhances readiness or proves to be more cost effective.

III. **Data:** The absence of clear and definitive congressional guidance on the use of contractor versus organic depot support has impaired the ability of commercial activities to effectively compete with organic activities. Concurrently, there are related problems such as depot repair capacity and the repair of high-technology components that have raised concerns about the adequacy of the present support structure. The increased use of contractors is an alternative that could resolve some of these problems as demonstrated during the Vietnam War.

IV. **Conclusions:** The most significant finding is that neither contract or organic support appear to possess a distinct advantage over the other. However, there are several factors that have hindered past efforts to increase the usage of contractor support in aeronautical depots.

## CONTINUED

1. Inadequate regulatory guidance from the Congress and DOD.
2. Limited surge capability of some contractors during wartime.
3. The demand rate for high-technology components is extremely low and is sometimes too costly for contractors to establish repair capabilities.
4. Cost comparisons between commercial and organic activities are misrepresented due to the differences in each activity's accounting procedures.

### V. Recommendations:

1. Revise existing DOD regulatory guidance to provide clear and specific directions to the services.
2. Increase the responsibilities and leadership role of the Joint Aeronautical Depot Maintenance Action Group (JADMAG) to encourage joint planning and resources sharing across the services for depot maintenance.
3. Increase the use of depot maintenance in mature overseas theaters.

## Chapter One

### INTRODUCTION

#### BACKGROUND

The growing federal budget deficit and reduction in defense spending require that the services seek alternatives to reduce depot support cost for their respective aircraft systems. Historically, Aeronautical Depot Maintenance (ADM) has cost the Department of Defense (DOD) approximately \$3.8 billion per year. (12:1) Since the mid-1960s Congress and the DOD have worked to reduce these significant expenditures. A number of agencies and organizations have conducted studies addressing the effectiveness, efficiency, and economy of DOD's depot maintenance establishments. Each service has always emphasized the need to maintain its own organic capability in its depots. (13:1) In recent years, the thrust of congressional policy on this issue has been to improve the economy and efficiency of the depots by either consolidation or contractor support. To date there has been very limited progress by the services to reduce depot operational support costs.

#### SIGNIFICANCE OF THE PROBLEM

The specific problem involves the reluctance of the services to convert organic activities to contract support even if it enhances readiness or proves to be more cost effective. As previously discussed, our limited defense budget dictates the need to minimize support cost whenever possible. During the last several years, the complexity of aviation systems have increased significantly. Accordingly, training requirements have increased in aeronautical depots and extensive capital investment has been allocated for fixed facilities, specialized tools, and complex test equipment. DOD's investment in test equipment alone exceeds \$30 billion dollars and is increasing rapidly. The services have added to this costly escalation by prematurely establishing organic support for aircraft systems as they enter their respective inventories. This practice was criticized in a Deputy Secretary of Defense memorandum, subject: Decisions to Acquire an Organic Logistic Support Capability for Major Weapon Systems, dated 27 October 1971. That memorandum expressed concern that the military departments were:

. . . making decisions to acquire an organic logistics support capability for major weapon systems far too early in the acquisition process . . . . We are reaching many logistics support decisions for depot maintenance and wholesale supply support before test programs have been established and/or completed . . . procedures in military departments need to be changed to stop this practice . . . . We must assure that such decisions are not made until we have reasonable assurance that the design has stabilized to a point where engineering changes will not be made that significantly impact on our decisions to acquire a full-fledged logistic support capability. I can see no reason why we can't rely on the contractor for such logistics support prior to design stabilization. (15:1)

Since World War II, our national defense strategy has shifted from massive retaliation to flexible response with emphasis on supporting contingencies by rapidly deploying forces. This has created shortfalls in the ability of the Army, Navy, and Air Force to provide depot maintenance support for the surges expected during contingencies. Prior to this shift in policy, the Army, Navy, and Air Force had used contractors extensively to support their respective aircraft systems during the Vietnam War with highly satisfactory results. Given the limited depot facilities available, it is likely that the services of contractors will be needed to support future contingencies as well.

Present guidance to the services on whether to use contractor or organic support in depots is not clearly defined. In December 1980, a report from the General Accounting Office stated:

Recognizing that the cost of logistic support--billions of dollars--exceeds development and procurement cost of major weapon systems, there is a critical need for early and continued consideration of logistics, no matter how expensive or troublesome--will have to be provided . . . . Problems include the unavailability of spare parts for aircraft systems too sophisticated for military personnel to operate, and the unavailability of personnel to support and operate systems. (6:2)

This report suggests that DOD needs to develop standard guidance to assist the services in determining the type of logistics support needed in the depots.

## ASSUMPTIONS AND LIMITATIONS

1. This paper will review depot operations in the Army, Navy, and Air Force.

2. Due to the variables common to cost comparisons, the conclusions and recommendations will focus on an examination of the current methodology used to conduct cost comparisons.

3. Reference to specific aviation weapon systems in each service will not be used since each system has significant technological differences and could potentially distort facts or create misrepresentations. Instead, a generic approach will be used when discussions in this area are necessary.

## OBJECTIVES

This paper will focus on these five major objectives:

1. Examine current policy and guidance to the services on logistic support determinations for depot repair of major aircraft components.

2. Analyze contractor and organic support and their ability to enhance depot repair capacity.

3. Compare and contrast contractor versus organic support for high technology components.

4. Conduct a comparison between organic and contractor support to determine the cost effectiveness of each system.

5. Provide recommendations based on comparison of organic and contractor support to determine the most practical and cost effective means of support.

The following chapters will address the aforementioned problems related to contractor and organic support in aviation depots and then determine the most practical and cost effective means of support. However, the first step is to examine the current policy and guidance from the Congress, Office of Management and Budget, and the Department of Defense.

## Chapter Two

### POLICIES ON DEPOT MAINTENANCE OPERATIONS

This chapter will show that present directives and regulations written by the Congress, The Office of Management and Budget (OMB), and the Department of Defense are confusing and often misinterpreted by the services. This chapter will analyze policy from these sectors of government to determine their effectiveness for selecting contractor versus organic support in Aeronautical Depots.

The past guidance from the Congress on this issue has always been ambiguous and loosely interpreted by the DOD. (10:4-3) The growing federal deficit has forced the Congress to draft new legislation in an effort to reduce expenditures for depot maintenance operations. The Defense Select Consolidation Act of 1986 provides direction for current Congressional Policy and requires DOD to take the following actions related to depot maintenance operations:

1. Management of all depot maintenance operations under a single manager, service, or agency.
2. Consolidation of wholesale depot facilities performing similar functions.
3. Determine the economic feasibility of contracting for the performance of base support operations by private sector enterprises. (9:3,4,8)

These actions are designed to reduce the overall cost of aeronautical depot operations and to improve their efficiency. Further examination of actions one and two reveals that a single manager for depot maintenance and the consolidation of bases and facilities are not considered to be feasible alternatives.

The consolidation of bases and facilities would only result in costly and unresponsive organizations with inadequate attention focused on missions of the services or contingency operations. The establishment of a single manager for depot operations would only burden the military departments with an additional layer of management that in the end would adversely affect aircraft readiness and contingency planning. Management decisions concerning the depots should continue to be made by each service. (13:1)

The third action which encourages the use of the private sector to perform base support operations is a viable solution but lacks specific details and directions from the Congress and OSD.

Congress generally has been supportive of efforts to increase the level of contractor support for functions currently performed in-house. There have been some efforts to direct additional contracts to commercial concerns, notably in legislation concerning use of small and disadvantaged business. However, for a variety of reasons, the services have retained the bulk of organic workloads in their own facilities . . . . The services' desire to maintain organic capability is reinforced by political pressures applied because most depot maintenance complexes are major employers to constituents of congressmen. (5:50)

Congressional policy is summarized as being ineffective prior to 1986. The Defense Select Consolidation Act was a positive step taken by Congress to clarify its guidance to DOD and the services.

OMB issues guidance for contracting certain activities in aeronautical depots. This guidance is found in "Circular A-76." A major shortcoming in the regulation is that it allows for exceptions which could be abused by the services to justify organic capabilities in their depots. In October 1976, the General Accounting Office (GAO) published a report entitled, Should Aircraft Depot Maintenance Be In-House or Contracted? This report had two major findings related to contractor versus organic support in depots.

1. It stated that OSD guidance on this subject is unclear and could be interpreted in several different ways.
2. The report criticized the services for not using the A-76 prescribed cost analysis procedure while making in-house versus contract decisions. (6:1)

This report and others from the GAO led to revisions in the A-76 program. In August 1983, the OMB completed its revision of Circular A-76. The new Circular provides the government's current policy of "relying on private enterprise to the maximum extent practical to provide needed products and services." (11:1) The Circular stipulates that the government should not perform a function or activity in-house when it can be provided more economically by a commercial activity. During the conduct of a cost comparison, the government is allowed to prove that it can perform the function at a lower cost than a contractor. The new guidance provides too much flexibility by allowing the services to retain certain activities in-house when determined to be critical for mission accomplishment. In some cases, the services will disregard lower bids by contractors in cost

comparisons and cite national defense as the basis for retaining organic depot support. (5:49-50) The cumulative effect of this practice across the services could prove to be extremely costly to the government. Accordingly, OMB policy should be further refined to eliminate such loopholes.

The initial OMB guidance caused the DOD to issue a number of directives and procedures to improve the economy and efficiency of operations within the depots. (See Appendix A) These documents were published before the 1983 revision of Circular A-76. Department of Defense Instructions (DODI) 4100.33, Operation of Commercial and Industrial Type Activities (CITA), stipulates that these activities be contracted to private enterprise whenever possible. It focuses on service contracts and support activities of \$100,000 or more. A review is conducted annually to determine whether the current type of support in an activity should be continued or whether a cost comparison should be performed for possible conversion to a contract. (3:1) This directive provides procedures on how to exempt activities from the review that are considered to be mission essential. Along the same line is DODI 4151.1; Use of Contractor and Government Resources for Maintenance of Material. It states that " . . . all workloads that are not characterized as mission essential should be contracted out." (4:1)

It authorizes the services to size their maintenance facilities to permit peacetime organic workloads to be accomplished using one shift on a forty-hour workweek. This rule intentionally provides slack in both capital use and manhour availability to support limited expansions in output during mobilization. This practice has been viewed as an indication of inefficiency by the Congress and a reason for consolidating depot management responsibilities across services. (5:51)

This is representative of the confusion that exists between DOD and the Congress on policy. The services also contend that this flexibility is critical during wartime. However, the DOD has not published definitive guidance to clarify this disputed area. The following are major shortcomings noted in current DOD Policy:

1. It fails to address wartime capability for depot operations.
2. It addresses maintenance in isolation and fails to recognize other critical functional areas such as training, supply, and transportation.
3. It does not address depot maintenance in overseas theaters. (9:4) The latter shortcoming is especially critical since " . . . the military departments spend over \$600 million annually on depot maintenance in the European and Pacific theaters, and plan to increase this amount substantially within the next few years." (10:iii)

The current DOD policy fails to address the use of contractors in overseas theaters. Accordingly, the services assumed this responsibility and have established their individual policies. The Army and the Air Force have interpreted DOD policies as allowing them to freely utilize contractor support for depot maintenance in overseas areas. " . . . the Navy's policy on performing depot maintenance overseas is long-standing. Except for emergency repairs and that maintenance required by permanently deployed aircraft, all depot maintenance is to be performed within U.S. boundaries." (10:1-3) The DOD should establish clear and definitive guidance for the services on overseas depot maintenance. The primary goals should be cost reduction, increased readiness, and sustainability.

In summary, the military services will continue to experience great difficulty when determining the type of logistical support needed in its aeronautical depots. This is due to the confusion and misinterpretations found in the various forms of legislation, directives, and regulatory guidance. The Department of Defense should work closely with OMB and the Congress to ensure its regulations meet the intent of congressional guidance.

## Chapter Three

### EFFECTIVENESS OF ORGANIC AND CONTRACTOR OPERATIONS

This chapter will compare and contrast both organic and contractor operations at depot level to determine their effectiveness. The present depot maintenance support structure is oriented toward meeting peacetime requirements and its ability to meet contingency requirements is limited. Wartime planning assumes that an additional surge capability would be critically needed in the depots for some components. (5:41) This capability is currently marginal due to cost constraints. The DOD and military services should orient their respective depot missions to ensure that adequate capability is available for contingency operations. In doing so, the services must determine the appropriate mix of both organic and contractor repair sources. A study by the Rand Corporation suggests the following as a viable support plan for depot operations:

1. Reliance on the manufacturer for repair early in the life cycle: - until designs stabilize; - perhaps with incentives to increase reliability.
2. Transitioning repair to controlled sources soon after a weapon is deployed with operational units.
3. Returning to contractor support, preferably with a repair specialist, as the technology ages, particularly if more repair sources become available. (5:37)

This strategy does not provide the optimal solution but could potentially result in cost reductions and enhanced readiness and responsiveness for aeronautical depots. The services have always been reluctant to convert organic activities to contract support even if it proved to be more cost effective. The reasons cited for the services' desire to maintain organic maintenance are:

1. Easier to control.
2. Perceived to be more flexible and responsive, and less expensive than contractors.
3. Reliable providers of the residual capacity needed to expand from peacetime to wartime production. (5:V)

All of these arguments are subject to further study and validation.

This review begins with the current depot organic support structure with particular attention to turnaround time for

components, availability of spare parts, and problems associated with high technology components. Because each of these variables could adversely affect organic activities and their ability to provide effective support, it is necessary we understand the problems associated with each.

The following factors have a significant impact on the repair and turnaround time of components: retrograde distribution time, availability of spares for repair of components, depot repair capacity, and technological updates. There is an additional increase in total repair time if repairables are not received in a timely manner. The actual repair time for a component in a depot facility is often referred to as hands-on-repair time. It represents a small percentage of the total time a component spends in a maintenance facility. A repairable component also spends time in the transportation system. The current transportation system within the services is not designed to rapidly evacuate end items, major assemblies, and components to depot activities and then return them to forward areas. (9:3-2) The DOD does not have the required transport capabilities to carry out such movements, especially in time of war. A non-responsive transportation system also impacts heavily on contract operations, since their overhaul lines are also dependent on the timely receipt of repairable assets. There is no distinct advantage for either type of support when operations are hindered by this shortfall.

Adequate stockage of spare parts is also a vital necessity to repair programs in aeronautical depots. In organic operations, the requirement for spare parts are computed and funded according to programmed levels of the flying hour program. Spare parts to support depot activities are then procured by government activities. This often presents problems due to the cumbersome procurement regulations that result in delayed deliveries of critical spare parts needed to sustain organic operations. In most cases, organic activities are prohibited from purchasing critical spare parts on a case-by-case basis even when they are readily available at commercial sources. The only flexibility available to these activities is to improve delivery time in the transportation system and to cannibalize from repairable carcasses. (5:62) In contrast, contractors have a great deal of bargaining power to obtain spare parts, but it may be reflected in higher prices. Advantages of utilizing contractors in this capacity are:

1. They are usually the sole source of supply for needed repairs.
2. Shortages can have serious operational implications.
3. The manufacturer's sales agents/contract negotiators are more knowledgeable--and more focused--than government contracting officers.

4. Cost related to changing suppliers are high, even for bringing the repair capability into an organic facility. (5:viii)

The implications of this comparison are that contract support should be utilized for component repair whenever aircraft readiness is affected by repair cycle problems in organic activities. This situation is most serious in overseas locations.

The use of contractors for depot maintenance in overseas theaters is a feasible approach toward resolving this problem. "By performing depot maintenance overseas in support of theater assets, the military departments shorten depot repair turnaround times and reduce the number of end items and spares required to fill the repair pipelines." (10:4-1) Significant cost savings have also been achieved by utilizing this support plan. For example, the Army's Theater Aviation Maintenance Program (TAMP) in Europe is designed for component repair of UH-1, OH-58, AH-1, and CH-47 helicopters. The estimated savings for the period FY86-FY90 could reach \$19.1 million. (1:B-1)

The next problem relates to the ability of the depots to increase their capacity if needed during contingencies. Sufficient depot repair capacity is an essential requirement that is needed to ensure an orderly transition from peacetime to wartime operations. The surge capability of depots in wartime performance should be considered by the services before selection of repair sources. The ability of depot level repair to provide increased capacity for wartime operational support is influenced by distribution system performance, spares availability, depot repair capacity, the range of items repaired at a single repair facility, and depot management philosophy and scheduling rules. (5:18) In the absence of these essential support factors, repair scheduling is the organic depot manager's most powerful tool for countering problems related to insufficient maintenance capacity. This management technique provides expeditious repair of those priority components that impact heaviest on aircraft readiness. Although this tool has proven to be successful for temporary periods of time, sizeable backlogs can be expected in depot facilities if problems related to insufficient capacity are not resolved.

Perhaps the most costly program for organic repair facilities is to support high-technological components on new aircraft systems. Specialized knowledge is needed to perform most repairs. Significant capital investments " . . . are needed not only for relatively high-technology components, which constitutes nearly half the inventory, but even for many lower-technology items." (5:vii) The initial acquisition of facilities and equipment are primary obstacles to establishing organic capability for high-technology components. The procurement of

test equipment creates the greatest expense to organic facilities.

DOD's investment in fielded test equipment exceeds \$30 billion and is increasing rapidly. The problems associated with acquiring and supporting test equipment are varied and significant. Much of it does not work as well as expected, is both difficult and costly to support, and is not suitable for its planned operational environment. For some test equipment, the services lack the assets necessary to support peacetime operating tempo, let alone those expected during wartime. (13:1)

The consequences go beyond the dollars already invested in the test equipment and the annual cost of its support. Weapon system readiness suffers from inaccurate, delayed, or prolonged testing. Depot maintenance workloads are increased unnecessarily with field repairable modules and components because test equipment in the field is neither available or operational. The training needed to operate this equipment is often too costly or not available for organic personnel. The original manufacturer can often provide this equipment and repair service to the government more cost effectively. (5:41) The bottom line is that the use of contractor support after the initial fielding of an aircraft system could reduce expenses for the repair of high-technology components.

In summary, the Honorable Frank C. Carlucci, Deputy Secretary of Defense in 1981, places the importance of this critical area in the proper perspective:

The readiness and sustainability of our aeronautical weapon systems . . . are to a large extent dependent on availability of technical and industrial capabilities of both in-house and contractor depot maintenance activities. The need to keep pace with technological advances in weapons and innovations in the industrial process, and to retain a viable industrial base, demands improved management of our depot maintenance resources. (14:1)

This statement emphasizes the need for improved management and increased use of our industrial capacity to sustain the readiness levels needed for our aircraft.

## Chapter Four

### COST COMPARISON METHODOLOGY

This chapter will show that cost comparisons are clearly important factors to consider in the repair sources decision process. A standardized cost accounting system does not presently exist in organic depots to provide a realistic comparison against commercial activities. An analysis of the organic cost accounting systems, by the GAO, reveals that the data collected is questionable in terms of comparability with commercial activities.

A brief account of the history of the organic accounting system indicates disparities within the process. "The Department of Defense has attempted since 1963 to establish a functioning cost accounting and reporting system which would apply to all DOD depot level maintenance activities." (2:5) In 1972, the Office of the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics formed a Joint Logistics Commander (JLC) panel to create a depot maintenance cost accounting manual to be used by all maintenance depots within all DOD components. The goal for this panel was to provide definitive instructions on the implementation of a common and manageable accounting system. The efforts of the panel resulted in the publication of DOD Instruction 7220.29, Guidance for Cost Accounting and Reporting for Depot Maintenance and Maintenance Support and DOD Handbook 7220.29, -H, Depot Maintenance and Maintenance Support Cost Accounting and Production Reporting Handbook. These two documents were designed to serve as handbooks for design of cost accounting systems within depots and to establish guidelines for reporting cost data by the depots. (2:1) The objectives of the new system were stated as follows:

To establish a uniform cost accounting system for use in accumulating the cost of depot maintenance activities as they relate to the weapon systems supported or items maintained. This information would enable managers to compare unit repair costs with replacement cost.

To assure uniform recording, accumulating and reporting of depot maintenance operations and maintenance support activities so that comparison of repair costs can be made between depots and between depots and contract sources performing similar maintenance functions.

To assist in measuring productivity, developing performance and cost standards and determining areas for

management emphasis, which would enable managers to evaluate depot maintenance and maintenance support activities for efficient resource use. To provide a means of identifying maintenance capability and duplication of capacity and indicating both actual and potential areas for interservices support of maintenance workload. (General Accounting Office, May 1978) (2:7)

The implementation date for this system was 1 October 1976. The Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) has overall responsibility for depot level maintenance within DOD. During the next several years the GAO and Defense Audit Service documented numerous cases of non-compliance and errors in the data submitted by the services to OSD. Although the services reported the data to OSD as requested, an access capability was not developed for several years. As a result, visibility of the depot maintenance program was restricted to data normally provided by the services during the budget process. (7:ii) In 1979, the Depot Maintenance Cost System (DMCS) and the Depot Performance Data Base System (DPDS) were developed to provide management information to OSD from the extensive set of historical depot cost and performance data submitted annually by the military services. This system has enhanced OSD's visibility of the Depot Maintenance Program, but has not fully established a uniform system within the depots. (8:ii)

Presently, the Office of the Assistant Secretary of Defense, (Acquisition and Logistics) (OASD) (A&L) has initiated a series of ongoing depot maintenance workshops. The purpose is to pursue the elimination or explanation of costing inconsistencies between the various services and to monitor the implementation of the basic guidance, DOD Handbook 7220.29-H. (2:8) The current Depot Maintenance Cost System (DMCS) has resulted in improved accounting and management systems in most depots. The importance of this data base is critical, especially when organic activities must compete against contract activities during A-76 cost analysis proceedings. The DMCS has streamlined and enabled organic facilities to become highly competitive for some component repair work. (2:7) However, due to inconsistencies noted in the system, it sometimes may result in meaningless comparisons between contract and commercial contractors.

There are several apparent differences in accounting procedures used by the government and the private sector. A US Navy study on contract versus organic repair cost provided the following pertinent information related to this area of interest:

One reason that prime contractors have high repair costs is that they usually absorb part of corporate overhead, which includes engineering and management labor. In addition, they may use skilled personnel to perform

tasks that could be done by less skilled people, and many of these contractors are located in areas with high unit labor costs. Accordingly, there would be increases in some repair costs if the share of overhead absorbed by current repair contracts exceeds that attributable to the repair business. (5:28)

Prices quoted by commercial contractors may often include charges for additional services unrelated to component repair. The following explains additional cost accounting problems that adversely affect commercial activities during cost comparisons:

1. It is not always clear what work is being accomplished for a particular level of cost.
2. Cost is an input measure, and no data are available to address the equally important quality issue.
3. It is difficult to make meaningful cost comparison across contractors, and even more difficult to compare contract and organic costs.
4. Unit price data maintained for contracted repairs are unreliable.
5. Relative costs have had little influence on evolution of the current mix of contract and organic repair. (5:30)

A final example of the disparities that exist between the two systems is stated as follows:

Government accounting rules understate manpower costs because they do not reflect fully the accrual of retirement plan liabilities, and the rates charged by the industrial fund may include charges to recoup past losses. On the other hand, commercial costs are affected by the overhead allocation rules that may distort cost comparisons. The inexpensive diode for which the government paid \$110 provides a particularly striking example of how allocation rules can distort cost data. (Department of Defense, 1984) (5:30,31)

In summary, the cost accounting systems used by the government and private sector are significantly different and the available data often creates misrepresentations during cost comparisons. A historical review of the cost accounting system in organic depots reveals that considerable progress has been made toward the development of a standardized system. In a number of cases organic repair sources have proven to be less expensive than contract repair sources. (5:30) However, auditors have noted significant differences in some price quotes by organic facilities that are repairing the same component. This indicates that additional work needs to be done by DOD and the services to improve the existing system. In the interim, contractors may be unduly penalized due to these inconsistencies. The accounting system in most commercial

activities includes numerous miscellaneous costs that are not necessarily found in the accounting systems of organic activities. The discussion of the economic aspects of the repair-source-selection can be summarized as follows:

1. Data concerning the relative costs of contract and organic repair are not necessarily comparable.
2. Comparative analysis conducted in the past suggest that contract operations are unlikely to enjoy a cost advantage over organic facilities unless the contractors are repair specialists.
3. Contractors represent a viable alternative even at a higher cost if they also satisfy projected wartime surge demands.
4. Different sources of repair may be appropriate for individual components at different stages of the weapon life cycle with cost not being the governing factor. (5:31)

This review of cost accounting procedures in contract and organic activities did not result in firm conclusions that one system provides advantages over the other. However, it does emphasize that there are misrepresentations in both systems that should be evaluated before one repair source is selected over the other.

## Chapter Five

### FINDINGS/CONCLUSIONS/RECOMMENDATIONS

#### FINDINGS AND CONCLUSIONS

This chapter summarizes the findings and conclusions that are applicable to contractor support for ADM. The foremost finding is that neither contract or organic support possess a distinct advantage over the other. However, the following are significant factors that have hindered past efforts to increase contractor support in aviation depots.

1. Inadequate regulatory guidance from the Congress and DOD.
2. Limited surge capability of some contractors during wartime.
3. The demand rate for high-technology components is extremely low and is sometimes too costly for contractors to establish repair capabilities.
4. Cost comparisons between commercial and organic activities are misrepresented due to the differences in each activity's accounting procedures.

The Military Departments have struggled for many years to interpret and comply with the published regulatory guidance that emphasizes the private sector for specific support requirements. As discussed in Chapter Two, the government's policies and procedures on contract support are ambiguous and have created much confusion among the services. It does not provide sufficient guidance for making contractor support decisions and should be revised with input from all affected parties. The absence of guidance on such critical issues as wartime surge capabilities may seriously affect our ability to sustain operations during prolonged contingencies. The Department of Defense must clarify its guidance to the services to ensure that readiness levels are sustained during wartime.

The present DOD guidance also affects the surge capabilities of aeronautical depots during wartime. The services must determine the appropriate mix of organic and contractor activities to support their requirements. Most contract activities have a limited surge capability due to the significant capital expenditures that are needed to enter the market. Organic facilities are similarly affected by capital investments but are also challenged by such factors as retrograde

distribution, shortage of spares, repair capacity and complications experienced with technological updates. Based on the assumption that neither contract or organic support will fully satisfy wartime requirements, capabilities should be maintained in both activities. This would ensure that adequate sources of repair are available to satisfy most requirements during contingencies. However, due to low demands it is difficult to establish and maintain both repair sources for high-technology components.

The one fact concerning the configuration of a military aircraft that can be stated with certainty is that it will change. Failures of the equipment originally installed, evolution of the threat, and the opportunities presented by technological advances will inevitably lead to redesign of major aircraft subsystems . . . . This instability in design makes it particularly difficult to develop efficient repair processes. (5:37)

The government's policy for supporting new technology is to remain with the original manufacturer until the design of the system has stabilized. If the services followed this plan, the expense of facilities, test, equipment, manpower, training and spares inventory needed for organic facilities could be avoided.

Cost comparisons have adversely affected contractors due to the differences in the accounting systems of organic and commercial activities. "Private firms must make a profit if they are to continue to exist." (5:89) The current cost accounting system for commercial activities includes corporate overhead charges for additional services that are not included in organic accounting systems. Accordingly, most cost comparisons show that organic activities are cheaper than commercial activities. "Peacetime cost should not, however, be the only factor considered in selecting sources of repair." (5:42) There are other critical factors such as responsiveness, quality of work, and surge capability that deserve careful evaluation prior to selecting a repair source.

### RECOMMENDATIONS

The need for revisions and improvements to regulatory guidance and the cost accounting system has been emphasized in Chapters Two and Four, respectively. The additional recommendations presented are based on a combination of research and the author's professional experiences.

The first involves increased use of the component repair strategy emphasized by the Rand Corporation in Chapter Three. The strategy involves reliance on the contractor during the early stages of a weapon system's life cycle, transitioning repair to

controlled sources after unit deployment, and returning to contractor support as the technology ages. The government can benefit from this strategy by using contractor support and avoiding cost in organic activities related to modifications, high-technology equipment, manpower, and training.

The second recommendation concerns improved management across the services for current depot maintenance operations. The single manager concept as discussed in the Defense Consolidation Act of 1986 is not a feasible alternative due to the management related problems identified in Chapter Two. Instead, the present system appears to be adequate to provide efficient management if the following actions are taken:

1. Revise existing DOD regulatory guidance to provide clear and specific directions to the services.
2. Increase the responsibilities and leadership role of the Joint Aeronautical Depot Maintenance Action Group (JADMAG) to encourage joint planning and resources sharing across the services for depot maintenance.

These minor changes could enhance present operations without radical and costly alterations to the existing management structure. The final recommendation is that depot maintenance should be increased in mature overseas theaters.

This would shorten depot repair turnaround times and reduce the number of end items and spares required to fill repair pipelines. These shortened turnaround times and reduced pipelines translate directly into enhanced readiness of theater equipment . . . . In the event of war, our forces will not be dependent solely on tenuous logistics lines of communication back to CONUS facilities. (10:4-1)

The current problem is that DOD policy does not specifically outline the use of contractors for overseas depot maintenance requirements. Regulatory guidance should be revised to require the services to use this capability under the appropriate circumstances.

In conclusion, this research indicates that neither contract or organic support possess a distinct advantage over the other in aeronautical depots. However, due to the present constraints on funding and force structure, it is likely that the role of contractors will be increased to support peacetime and future contingency operations. A strong industrial base is critical to our national defense and continued survival as a free nation.

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## APPENDIX

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### APPENDIX A

#### DEPARTMENT OF DEFENSE INSTRUCTIONS

1. DOD Instruction 4100.33, Operation of Commercial and Industrial-Type Activities (CITA), February 25, 1980.
2. DOD Instruction 4151.1, Use of Contractor and Government Resources for Maintenance of Material, July 15, 1982.
3. DOD Directive 5000.1, Major System Acquisition, March 29, 1982.
4. DOD Instruction 5000.2, Major System Acquisition Procedures, March 8, 1983.

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